

AMENDMENT AND RESPONSE

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Serial No.: 10/727,005

Filing Date: December 3, 2005

Attorney Docket No. 100.127US02

Title: DYNAMIC DISTORTION CONTROL

REMARKS

Applicant has reviewed the Office Action mailed on June 27, 2005 as well as the art cited. Claims 5, 7, 10, 12 and 20 have been amended. Claim 3 has been canceled without prejudice or disclaimer. As a result, claims 1, 2, and 4 - 22 are pending in this application.

Elections/Restrictions

Applicant thanks the Examiner for indicating that the Restriction Requirement mailed November 17, 2004 was withdrawn.

Double Patenting Rejection

Claims 10, 12 and 14 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 8, 11, 13, 14, 17 and 19 of U.S. Patent No. 6,687,466. A Terminal Disclaimer in compliance with 37 CFR § 1.321(c) is enclosed herewith to overcome these rejections, along with the required fee.

Rejections Under 35 U.S.C. § 112

Claim 3 was rejected under 35 USC § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

In particular, the Examiner states "Claim 3 recites 'pre-distorter comprise of non-magnetic phase inversion circuits.' The specification, as originally filed, does not show structure or circuit diagram provided to teach a person of ordinary skill how the non-magnetic phase inversion circuits provided in the pre-distortion." Applicant respectfully asserts that the non-magnetic phase inversion circuits are described and depicted in Application Serial No. 09/479,298 incorporated in the present application by reference. Therefore, Applicant does not concede the Examiner's point. However, to further prosecution of this application, Applicant has canceled claim 3 without prejudice or disclaimer. The rejection of claim 3 is now moot.

Claims 7, 12 and 20 were rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the

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Applicant regards as the invention. The Examiner indicated that claims 7, 12 and 20 recite the limitation "the channel raster alignment," but that there was insufficient antecedent basis for this limitation in the claims.

Claims 7, 12, and 20 have been amended to correct the antecedent basis issues and withdrawal of the rejection of claims 7, 12 and 20 is requested.

Rejections Under 35 U.S.C. § 103

Claims 1, 2, 4, 5, 7, 8, 10-12, 14, 16-18, 20 and 21 were rejected under 35 USC § 103(a) as being unpatentable over Pidgeon (U.S. Patent No. 5,850,305). Applicant respectfully traverses this rejection.

Claims 1, 2, 4, 5, 7, 8

Claim 1 is directed to a transmitter. The claim reads as follows:

1. (Original) A transmitter, comprising:
 - an input, coupleable to receive an RF signal;
 - a pre-distorter, coupled to the input, that selectively adds distortion to the RF signal;
 - a laser that provides a light source for optical transmission;
 - a modulator, coupled to the laser and the pre-distorter, that modulates the light from the laser with the RF signal from the pre-distorter to produce an output for the transmitter;
 - wherein the distortion added by the pre-distorter is controlled to reduce distortions in the output of the transmitter generated by the modulator;
 - a distortion monitor, coupled to the output of the transmitter, that monitors at least one frequency of the output of the transmitter to detect distortion in the modulator output without the use of a pilot tone; and
 - a microprocessor, coupled to the distortion monitor, the pre-distorter, and the modulator that uses an output of the distortion monitor to selectively generate at least one control signal for one of the modulator and the pre-distorter to reduce the distortion in the output of the transmitter.

Applicant respectfully asserts that Pidgeon does not teach or suggest the transmitter of claim 1. The Examiner correctly indicates that Pidgeon "does not specifically disclose [a] microprocessor." The Examiner asserts that "it would have been obvious to one of ordinary skill in the art to provide [a] microprocessor to perform various functions of the system.

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One of ordinary skill in the art would have been motivated to do such in order to provide fast and efficient control of various tasks.” (See Office Action, page 8) In assessing the motivation to modify the reference, the Examiner has provided no evidentiary basis to support the assertion that Pidgeon suffers from the need for a microprocessor to perform various functions of the system. Absent such evidence, the assertion that Pidgeon teaches or suggests the transmitter of claim 1 is improper. Therefore, withdrawal of the rejection of claim 1 is respectfully requested.

Claims 2, 4 and 8 depend directly, and claims 5 and 7 indirectly, from claim 1 and thus are allowable at least for the reasons identified above with respect to claim 1. Therefore, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 2, 4, 5, 7, and 8. In addition, since the Applicant believes these dependent claims are allowable for the above reasons, the Applicant retains the right to provide other arguments if a further response is required.

Claims 10-12, 14

Claim 10, as amended, is directed to a method for controlling a non-linear device. Claim 10 reads as follows:

10. A method for controlling a non-linear device, the method comprising:
receiving an output signal of the non-linear device;
monitoring the output signal for distortion at a first selected frequency;
generating signals indicative of a level of distortion at the monitored first frequency; and
when the signal indicates excessive distortion is present in the output signal, processing the signal indicative of a level of distortion in a microprocessor to selectively generate at least one control signal for one of the non-linear device and a pre-distorter to reduce the distortion.

Applicant respectfully asserts that Pidgeon does not teach or suggest the method of claim 10. In particular, Pidgeon does not teach or suggest “processing the signal indicative of a level of distortion in a microprocessor to selectively generate at least one control signal for one of the non-linear device and a pre-distorter to reduce the distortion.” As discussed above, the Examiner agrees that Pidgeon does not disclose use of a microprocessor. Applicant further asserts that nothing in Pidgeon teaches or suggests implementing this function in a microprocessor. There is

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no evidence of record indicating a problem with Pidgeon that would be overcome by use of a microprocessor as claimed. Withdrawal of the rejection of claim 10 is respectfully requested.

Claims 11, 12, and 14 depend directly from claim 10 and thus are allowable at least for the reasons identified above with respect to claim 10. Therefore, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 11, 12, and 14. In addition, since the Applicant believes these dependent claims are allowable for the above reasons, the Applicant retains the right to provide other arguments if a further response is required.

Claims 16, 18, 20, 21

Claim 16, as amended, is directed to a transmission system. Claim 16 reads as follows:

16. (Original) A transmission system, comprising:
- at least one optical transmitter with an input coupleable to receive input data and providing at least one optical output;
 - at least one optical link coupled to each of the at least one optical output;
 - an optical receiver coupled to each of the at least one optical link;
 - the optical transmitter including an optical modulator and a pre-distorter circuit, wherein the pre-distorter generates distortions to reduce distortions in the output of the optical transmitter; and
 - a control circuit for dynamic distortion control in the optical transmitter, the control circuit comprising:
 - an input coupleable to receive a signal from the optical modulator of the transmitter;
 - a first frequency monitor, coupled to the input, that monitors the level of distortion at a first frequency and that creates a first signal indicative of the level of the distortion without the use of a pilot tone; and
 - a controller, coupled to the first frequency monitor to receive the first signal and to selectively create at least one control signal for one of the modulator and the pre-distorter.

Applicant respectfully asserts that Pidgeon does not teach or suggest the system of claim 16. In particular, Pidgeon does not teach or suggest a control circuit that includes a frequency monitor and a controller as called for in claim 16 that selectively creates control signals. The Examiner recognized that Pidgeon does not teach a controller. Applicant respectfully asserts that

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there is nothing in Pidgeon that teaches or suggests the desirability or need to modify Pidgeon with a controller. Withdrawal of the rejection of claim 16 is respectfully requested.

Claims 18 and 21 depend directly, and claim 20 indirectly, from claim 16 and thus are allowable at least for the reasons identified above with respect to claim 16. Therefore, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a) and allowance of claims 18, 20, and 21. In addition, since the Applicant believes these dependent claims are allowable for the above reasons, the Applicant retains the right to provide other arguments if a further response is required.

The Examiner rejected claims 9 and 22 under 35 U.S.C. § 103(a) as being unpatentable over Pidgeon in view of the prior art disclosed by Pidgeon. Applicant respectfully traverses this rejection.

Claim 9

Claim 9 depends directly from claim 1 and thus is also allowable for the reasons discussed above with respect to claim 1. Claim 9 further includes a pilot tone generator that selectively adds distortion detectable at the second frequency. Applicant respectfully asserts that the references, either alone or in combination, does not teach or suggest the claimed invention.

The Examiner asserts that "it would have been obvious to an artisan of ordinary skill in the art to provide [a] pilot tone to the optical system. One of ordinary skill in the art would have been motivated to do such in order to detect intermodulation distortion from the signal carrier." (See Office Action, page 15) Applicant respectfully contends that Pidgeon teaches away from the prior art disclosed by Pidgeon. In contrast, Pidgeon states "A drawback to the system of [prior art] FIG. 1 is that the intermodulation distortion of the two low level [pilot tones] carriers has a relatively low power level which may fall near or below the minimum detectable level of the photodetector and photodetector amplifier, making this distortion difficult to detect." (See Pidgeon, Col. 2, lines 19-24). Therefore, since the disclosure of Pidgeon teaches away from the prior art, the Examiner's stated motivation fails to provide a reason to combine the references. Withdrawal of the rejection of claim 9 is respectfully requested.

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Claim 22

Claim 22 depends directly from claim 16 and thus is also allowable for the reasons discussed above with respect to claim 16. Claim 22 further includes a pilot tone generator that selectively adds distortion detectable at the second frequency

Applicant refers the Examiner to the argument presented above with respect to claim 9. As a result, withdrawal of the rejection of claim 22 is respectfully requested.

The Examiner rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Pidgeon in view of Little et al. (U.S. Patent No. 5,430,568). Applicant respectfully traverses this rejection. Further, this rejection is moot because claim 3 has been cancelled as discussed above.

The Examiner rejected claims 6 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Pidgeon in view of Scheinberg (U.S. Patent No. 5,625,307). Applicant respectfully traverses this rejection.

Claim 6

Claim 6 depends directly from claim 4, and indirectly from claim 1, and thus is also allowable for the reasons discussed above with respect to claims 1 and 4.

Claim 6 further includes wherein the first and second frequency monitors of claims 1 and 4 include double balanced mixers. Applicant respectfully asserts that the references, either alone or in combination, do not teach or suggest the claimed invention.

The Examiner correctly indicates that Pidgeon "does not disclose the use of double balanced mixers." The Examiner asserts that "it would have been obvious to an artisan of ordinary skill in the art at the time of the invention was made to provide [a] double balanced mixer as disclosed by Scheinberg to the optical transmission system of Pidgeon. One of ordinary skill in the art would have been motivated to do such since double balanced mixer[s] provide excellent carrier suppression and low order distortion and [are] well suited for monolithic integration." (See Office Action, page 16) In assessing the motivation to combine the references, the Examiner has provided no evidentiary basis to support the assertion that Pidgeon suffers from the need for double balanced mixers to provide carrier suppression and low order

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distortion, particularly with respect to being well suited for monolithic integration. Absent such evidence, the combination of the references is improper. Withdrawal of the rejection of claim 6 is respectfully requested.

Further, Applicant respectfully contends that the basis for combining Pidgeon in view of Scheinberg in rejecting claim 6 under 35 U.S.C. §103(a) is unfounded. The Examiner's argument that combining Pidgeon in view of Scheinberg "would have been obvious to an artisan of ordinary skill in the art" is a conclusory statement based on hindsight reasoning. In addition, the Examiner has failed to establish a sufficient showing as to why it would have been obvious to one of ordinary skill in the art to combine the teachings of Scheinberg with its frequency conversion integrated circuit for "monolithic implementation of high frequency analog systems" (See Scheinberg, Col. 1, lines 13-15) together with the optical transmitter of claim 6 which does not teach or relate to the problems disclosed by Scheinberg. Combining prior art references without the requisite suggestion, teaching, or motivation impermissibly takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability - the essence of hindsight. See, e.g., *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985). The Examiner is impermissibly using the inventor's own disclosure as a template for combining references. As a result, Applicant respectfully asserts that claim 6 is allowable.

Claim 19

Claim 19 depends directly from claim 18, and indirectly from claim 16, and thus is also allowable for the reasons discussed above with respect to claims 16 and 18.

Claim 6 further includes wherein the first and second frequency monitors of claims 16 and 18 include double balanced mixers. Applicant refers the Examiner to the argument presented above with respect to claim 6. As a result, withdrawal of the rejection of claim 19 is respectfully requested.

Allowable Subject Matter

Applicant thanks the Examiner for indicating that claim 15 is allowed.

Claim 13 was objected to as being dependent upon a rejected base claim, but was indicated to be allowable if rewritten in independent form including all of the limitations of the

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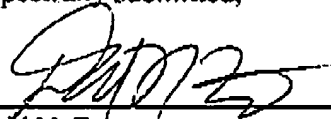
base claim and any intervening claims. In light of the arguments presented with respect to claim 10, claim 13 has not been amended to place it in independent form at this time.

CONCLUSION

Applicant respectfully submits that claims 1, 2, and 4-22 are in condition for allowance and notification to that effect is earnestly requested. If necessary, please charge any additional fees or credit overpayments to Deposit Account No. 502432.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at (612) 332-4720.

Respectfully submitted,

Date: December 27, 2005

David N. Fogg
Reg. No. 35,138

Attorneys for Applicant
Fogg and Associates, LLC
P.O. Box 581339
Minneapolis, MN 55458-1339
T - (612) 332-4720
F - (612) 332-4731